

A SYNOPSIS OF THE GENERA OF AGROMYZIDÆ, WITH DESCRIPTIONS OF NEW GENERA AND SPECIES.

By J. R. MALLOCH,

Of the Bureau of Entomology, United States Department of Agriculture.

INTRODUCTION.

My original intention was to give a revision of the genera and species in this family, but I have found it impossible to accomplish this in the time at my disposal, so I have confined my work to that presented in this paper and to a revision of the species of the genus *Agromyza*, which is to appear in the Annals of the Entomological Society of America.

I have revised the nomenclature so as to bring it into conformity with that used by the most recent writers who have dealt with the family.

Where new species are described in old genera the species previously known from this country are tabulated, except in *Phytomyza*, and this is also done where the generic relations are different from those used in Aldrich's Catalogue of North American Diptera.

The species of this family may be known from the other Acalyptrate Muscidæ by the following characters: Eyes separated in both sexes, bare, or pilose; arista bare, or pubescent, never combed; vibrissæ differentiated, except in Ochthiphilinæ; palpi and proboscis often enlarged; post-vertical bristles generally present; thorax with always at least one pair, generally two, of dorso-central macrochaetæ; at least the sternopleura with one bristle; legs without any preapical bristle. In *Agromyza* there are generally two postero-dorsal setulæ on mid tibia but the dorsal surface is without bristles; wings with subcostal vein indistinct, incomplete, or joining first vein; costa reaching to vein three or four; outer cross vein rarely much beyond wing middle, sometimes absent (*Phytomyza* and *Paramyia*); basal cells always distinct.

In the Ephydridæ and Drosophilidæ the basal cells are generally indistinct, or absent; and the arista is often combed. The genera in Geomyzidæ have often the dorsal preapical tibial bristle distinct and

costal wing vein spinose, as well as the arista plumose or sub-plumose. The Chloropidæ have the frons bare or at least without bristles; the basal cells of wings absent and generally a peculiar curve at the middle of penultimate section of fifth vein; the pleuræ are bare.

HABITS OF THE SPECIES.

Most of the species in the larval stage in Agromyzinæ are phytophagus, making mines in leaves and stems of plants, and a few species of the genus *Agromyza* make galls on twigs of trees. The Phytomyzinæ are, so far as is known, miners in leaves. The larvæ of *Ochthiphila* have been found in galls of *Triticum repens*. The species of the genus *Leucopis*, so far as they are known, feed upon aphides and scale insects. The single American species of the genus *Cerodontha* mines the stems of wheat and does considerable damage. The peculiar genus *Cryptochætum* is predaceous in the larval state on coccids.

The perfect insects are generally found on flowers, some of them being especially abundant on the flowers of umbelliferous plants in late summer.

TERMINOLOGY.

Center stripe.—An usually opaque stripe inclosed between the orbits and generally differentiated from them by being less shining and rather more depressed. Bare in Agromyzinæ; in the Milichinæ and in some of the Ochthiphilinæ, with short bristles.

Frons.—This term I have used to designate the space bounded by the eyes laterally, the frontal lunule anteriorly, and the vertex posteriorly. It includes the orbits, center stripe, and ocellar triangle.

Lunule.—A small lunulate portion in front of frons and immediately over antennæ.

Occiput.—That part of head behind eye, viewed from the side.

Ocellar region.—This term I have used instead of the "ocellar spot" used by some writers. It is the slightly raised triangular portion occupied by the ocelli.

Ocellar triangle.—This is a large subtriangular, generally glossy, portion with its base at vertex and its apex intersecting the center stripe, on which are situated the ocellar region and ocelli. In most of the species in *Agromyza* and some other genera it is not distinguishable, but in some of the Milichinæ it is much more evident, approaching more nearly to the Chloropidae, in which family it is very distinct.

Orbit.—The narrow, more or less shining lateral stripe upon which are situated the *orbital bristles*.

Post-vertical bristles.—The pair situated immediately behind the ocelli on the vertex.

Vibrissa.—The usually differentiated bristle at anterior margin of cheek on a level with upper mouth margin.

The other terms used in descriptions are such as are used in most works dealing with Diptera and require no further explanation.

SYNOPTIC TABLE OF SUBFAMILIES IN AGROMYZIDÆ.

1. Postvertical bristles distinctly divergent, always distinct ¹..... 2
 Post vertical bristles not divergent, either directed straight backward, or cruciate,
 or indistinguishable 3.
2. Outer cross vein always present and situated beyond inner cross vein.
 AGROMYZINÆ.
 Outer cross vein absent, or situated anterior to, or directly under inner.
 PHYTOMYZINÆ.
3. Central stripe of frons with generally two rows of setulæ, or if these are absent the
 anterior margin has several distinct setulæ in a transverse row; vibrissa generally
 differentiated from marginal mouth bristles..... MILICHINÆ.
 Central stripe of frons bare except for sometimes scattered short hairs, which are
 not regularly arranged in two stripes, anterior margin without distinct setulæ;
 ocellar triangle seldom distinct (*Cryptochætum*); vibrissa absent or rarely differ-
 entiated from marginal mouth bristles..... OCHTHIPHILINÆ.

SYNOPTIC TABLE OF GENERA IN AGROMYZINÆ.

1. Mesopleura bare..... 2.
 Mesopleura with at least one strong bristle..... 3.
2. Frons buccate, the ocelli situated on a humplike protuberance in vertical line
 above the antennæ (pl. 5, fig. 13)..... *Traginops* Coquillett.
 Frons normal in shape; ocelli situated well back toward vertex (pl. 5, fig. 15).
 Odinia Robineau-Desvoidy.
3. Third antennal joint terminating in a thornlike point on upper side.
 Cerodontha Rondani.
 Third antennal joint not terminating in a sharp point on upper side.
 Agromyza Fallen.

These four genera are all that I consider belong to this subfamily. The species which stand in the collection as *Cacoxenus* have cruciate postvertical bristles, which excludes them from this subfamily.

SYNOPTIC TABLE OF GENERA IN PHYTOMYZINÆ.

1. Outer cross vein absent..... *Phytomyza* Fallen.
 Outer cross vein present, but situated anterior to, or directly below, the inner cross
 vein (pl. 4, fig. 4)..... *Napomyza* v. d. Wulp.

Some writers do not recognize the validity of *Napomyza*, but in most cases it is ranked as distinct from *Phytomyza*. *Paramyia* Williston belongs to the Milichinæ.

SYNOPTIC TABLE OF GENERA IN OCHTHIPHILINÆ.

1. Orbital bristles present..... 4.
 Orbital bristles absent..... 3.
2. Arista absent (pl. 4, fig. 5; pl. 6, fig. 29)..... *Cryptochætum* Rondani.
 Arista present..... 3.

¹ *Hemeromyia* has the postvertical bristles slightly divergent in type, but they are very small, there are two bristles on anterior margin of frons, and in other respects it has so much the habitus of the Milichinæ that I consider it really belongs to that subfamily.

3. Costa with short black thorns; mesonotum with one pair of dorso-central bristles.
Paraleucopis, new genus.
 Costa without such thorns; mesonotum with two pairs of dorso-central bristles.
Leucopis Meigen.
4. Head produced in front, the face receding almost horizontally (pl. 5, fig. 16).
Acrometopia Schiner.
 Head only slightly produced in front, the face, if receding, only slightly so, not nearly horizontally..... 5.
5. Mesopleura bare..... *Ochthiphila* Fallen.
 Mesopleura with 1-2 strong bristles..... 6.
6. Mesonotum with only one pair of dorso-central bristles..... *Cacoxenus* Loew.
 Mesonotum with at least two pairs of dorso-centrals. (Head, pl. 6, fig. 23).
Pseudodinia Coquillett.

The genus *Parodinia* belongs to the Geomyzidæ.

SYNOPTIC TABLE OF GENERA IN MILICHINÆ.

1. Wing with a distinct, wedge-shaped incision at that portion where the subcostal vein should join costa (pl. 4, fig. 1)..... 2.
 Wing without a deep incision at this part, costa sometimes interrupted..... 5.
2. Hind margin of eyes vertical, without an incision at about their middle (pl. 5, fig. 14)..... 3.
 Hind margin of eye with a more or less triangular incision at about the middle (pl. 5, fig. 12)..... *Milichiella* Giglio Tos.
3. Mesopleura bare..... *Milichia* Meigen.
 Mesopleura with 3-4 strong bristles..... 4.
4. Proboscis long, geniculate (pl. 5, fig. 14)..... *Pholeomyia* Bilimek.
 Proboscis not long and geniculate..... *Paramilichia* new genus.
5. Eyes long haired; frons, thorax, including pleuræ, and abdomen long haired, the normal bristles almost indistinguishable from the hairs... *Arctobiella* Coquillett.
 Eyes much shorter haired, or bare; the frontal and thoracic bristles distinguishable from the much shorter setulæ..... 6.
6. Fourth vein upwardly directed, at its apex very close to third; proboscis very long and slender, geniculate (pl. 5, fig. 20; pl. 4, fig. 6)..... *Eusiphona* Coquillett.
 Fourth vein only slightly or not at all approaching third; proboscis, if geniculated, not conspicuously long and thin..... 7.
7. Outer cross vein absent (pl. 4, fig. 7)..... *Paramyia* Williston.
 Outer cross vein present..... 8.
8. Palpi exceptionally large, projecting much beyond mouth margin (pl. 5, figs. 17-19).
Phyllomyza Fallen.
 Palpi not projecting much beyond the mouth margin..... 9.
9. Proboscis geniculate and elongated, but not very slender (pl. 5, fig. 9)..... 10.
 Proboscis not geniculate and elongated..... 14.
10. Costa reaching to third vein (pl. 6, fig. 30)..... *Aldrichiella* Hendel.
 Costa reaching to fourth vein..... 11.
11. Mesopleura bare..... 12.
 Mesopleura with 2-3 strong bristles..... 13.
12. First costal division bristled; the entire body, including frons, not glossy; post-vertical bristles strong; the two upper orbital bristles directed outward, over the eye..... *Desmometopa* Loew.
 First costal division bare; the entire body, including frons, polished; post-vertical bristles short; upper orbital bristle backwardly directed, the one below it directed forward..... *Paramadiza*, new name.

13. Frons with two rows of short bristles on the central stripe.....¹ *Rhcnæssa* Loew.
Frons bare except for the orbital bristles.....¹ *Tethina* Haliday.
14. Costa reaching to third vein, fourth vein indistinct (pl. 4, figs. 2, 3, 8)..... 15.
Costa reaching to fourth vein, fourth vein distinct.....¹ *Hemeromyia* Coquillett.
15. Mesopleura bare.....¹ *Euchlorops*, new genus.
Mesopleura with 2-3 bristles..... *Meoneura* Rondani.

I have retained *Hemeromyia* Coquillett in the Milichinæ because it has more affinities with this family than with the Geomyzidæ, to which group it bears some resemblance in its possession of the short costal thorns. *Parodinia*, while possessing these spines also, has in addition preapical tibial bristles.

Genus MILICHIELLA Giglio-Tos.

Milichiella GIGLIO-TOS, Ann. Soc. Ent. France, 1895, p. 367.

Ophthalmomyia WILLISTON, Trans. Ent. Soc. Lond., 1896, p. 426.

Stenoporomyia HENDEL, Wien. Ent. Zeitg., vol. 22, 1903, p. 250.

The characters given in the synoptic table of genera should serve to separate this from the other genera in Milichinæ. Becker in his paper on this group ² gives 17 species as belonging to this genus from various parts of the world. I have only found four of these in the U. S. National Museum collection, one of which, *lucidula*, has not been recorded, under that name, from America.

SYNOPSIS OF SPECIES IN MILICHIELLA.

Males.

1. Abdomen almost entirely silvery white pollinose..... 2.
Abdomen black, or with only two white spots..... 3.
2. Mesonotum shining black; third and fourth veins strongly convergent.
arcuata Loew.
Mesonotum dull gray, generally with brownish longitudinal vittæ; third and fourth veins only slightly convergent.....*cinerea* Coquillett.
3. Second abdominal segment with two white side spots.....*lucidula* Becker.
No white spots on second segment.....*lacteipennis* Loew.

Females.

1. Mesonotum glossy black..... 2.
Mesonotum dull gray, with brown vittæ.....*cinerea* Coquillett.
2. Incision on posterior margin of eye large; disk of abdomen, except that of last segment, subopaque; last section of fourth wing vein one and one-third times as long as penultimate; outer cross vein at about its own length from end of fifth.
lacteipennis Loew.
Incision on posterior margin of eye small; disk of abdomen entirely glossy; last section of fourth vein twice as long as penultimate; outer cross vein about twice its own length from end of fifth.....*arcuata* Loew.

¹ Some species of *Rhcnæssa* and *Tethina* will run to 14, in which case *Tethina* may be separated from *Hemeromyia* by the absence of costal thorns, and *Rhcnæssa* by the character which separates it from *Tethina*.

² Ann. Mus. Nat. Hung., vol. 5, 1907, p. 507.

MILICHIELLA ARCUATA Loew.

Lobioptera arcuata LOEW, Zeit. Ges. Naturw., 1876, p. 339.

Milichia arcuata (Loew), ALDRICH, Cat. N. A. Dipt., 1905, p. 651.

Represented in U. S. National Museum collection by one male specimen from each of the following localities: District of Columbia (collection Coquillett); Bladensburg, Maryland (H. S. Barber); and Toronto, Canada (Brodie collection). I have also seen four specimens, two males and two females, from Natchez, Mississippi, May 20, 1909 (E. S. Tucker). The female has not been previously recorded, and should be readily distinguished by the characters given in the above table, as also its smaller size (1.5 mm.).

MILICHIELLA CINEREA Coquillett.

Ophthalmomyia cinerea COQUILLETT, Proc. U. S. Nat. Mus., vol. 22, 1899, p. 268.

This species was described from a single female. The two males in collection U. S. National Museum differ in having the abdomen silvery white, except the hypopygium, which is black. The second abdominal segment in the male is about twice as long as the third, which is subequal in length with the fourth and fifth. In other respects the male is similar to the female.

This species must be very close to *M. parva* Macquart from the Isle de Bourbon, but the third and fourth veins are parallel in *parva*, whereas in *cinerea* they are slightly, but appreciably, convergent at their apices, and *parva* is described as black and not gray.

Localities.—Type, Bayamon, Porto Rico, January, 1899 (A. Busck); males, Santo Domingo, West Indies, June 8, 1905 (A. Busck); Philadelphia, Pennsylvania (C. W. Johnson).

MILICHIELLA LUCIDULA Becker.

Milichiella lucidula BECKER, Ann. Mus. Nat. Hung., vol. 5, 1907, p. 537.

I find two males of this species in U. S. National Museum collection that agree with Becker's description. The type came from Peru; but in spite of the fact that the museum specimens came from Carlinville, Illinois (Robertson), I am convinced they are the same as Becker's species. In the male this species may be distinguished from *lacteipennis* by the presence of a silvery white spot on each side of the second segment of the abdomen. In other respects it agrees closely with that species. The female is undescribed, and will be very difficult to separate from the female of *lacteipennis*, as the silvery abdominal spots will presumably be absent. I took one male of this species in Virginia close to the Highway Bridge over the Potomac May 25, 1913.

The species recorded as *M. bisignata* Coquillett in Smith's list of New Jersey Diptera is, I have found upon examination, identical with the Carlinville specimens. I can find neither the type of *bisignata* in the collection here, nor any published description, and conclude that

the species must rank as *nomen nudum*. In the edition of Smith's list, which appeared prior to that of 1909, this species is included amongst the Sepsidæ.

MILICHIELLA LACTEIPENNIS Loew.

Plate 5, fig. 12.

Lobioptera lacteipennis LOEW, Dipt. Amer. Sept. Ind. Cent., 6, species 97.

This appears to be a fairly common species, and is very widely distributed. It was originally described from Cuba; there are specimens in collection from Biscayne Bay, Florida (Mrs. A. T. Slosson); District of Columbia (collection Coquillett); Holly Springs, Mississippi (F. W. Mally); Texas (Belfrage); Mesilla, New Mexico (T. D. A. Cockerell); Selma, Alabama, one female taken among aphides on cotton, October (W. H. Patten); Santa Clara County, California (Baker); Brownsville, Texas (C. H. T. Townsend); Dallas, Texas (C. R. Jones); Plano, Texas (E. S. Tucker); Victoria, Texas (W. E. Hinds); Whittier, California (P. H. Timberlake); Boerne, Texas (F. C. Pratt); Waco, Texas (Belfrage); Bayamon, Porto Rico, January, 1899 (A. Busck); and Santo Domingo, West Indies (A. Busck). There are also specimens in collection Ceara, Brazil (F. D. da Rocha); the island of Guam (D. T. Fulloway); and several specimens taken in Oahu, Hawaiian Islands, by W. H. Ashmead.

Genus MILICHIA Meigen.

Milichia MEIGEN, Syst. Besch., vol. 6, 1830, p. 131.

Lobioptera WAHLBERG, Kgl. Vetensk. Akad. Forh., 1847, p. 259.

This genus may be distinguished by the posterior margin of the eye having no triangular excision, and the mesopleura being bare. The proboscis is not geniculated, though rather over the normal size, and, except at apex, chitinized.

The species described herewith is the only American representative of the genus which I have seen, and, with this exception, nothing is known of their larval habits.

MILICHIA AETHIOPS, new species.

Male.—Entirely black, only the halteres brownish.

Frons glossy black, sides divergent posteriorly, at upper margin distinctly short of one-third the width of head, at lower margin slightly over one-half as wide as at upper; surface with longitudinal furrows; orbits very narrow; three orbital bristles present, and a few scattered additional short orbital hairs; the two rows of setulæ on center stripe distinct; antennæ black, of normal size, third joint rounded, its surface covered with very short, pale, pilosity; arista with basal joints distinct, and swollen; cheeks linear, marginal bristles strong and closely placed, the vibrissæ differentiated slightly and incurved; proboscis yellow at apex; palpi black. Mesonotum glossy; two pairs of dorso-centrals present, the anterior pair weak; the pair of bristles between the posterior pair distinct; squamæ white,

fringe yellowish. Abdomen shining, the surfaces of segments 2-4 granulose and less glossy than fifth; second and fifth segments elongated. Legs black; covered with short hairs, the ventral surfaces of femora bristled. Wings whitish, veins yellowish, costal setulæ black, carried, as usual, to end of second vein; venation almost identical with that of *Milicheilla lacteipennis*, the third and fourth veins being distinctly convergent at their apices.

Length.—2 mm.

Type.—Cat. No. 15745, U.S.N.M.

Locality.—Harlingen, Texas, "reared from wild tuber," April, 1909 (McMillan and Marsh).

The female is similar in most respects to the male, but the frons is distinctly broader and the halteres are generally pale yellow. In all there are eight specimens before me which were labeled *Agromyza aeneiventris* Fallen, and may have been recorded under that name.

Genus PHOLEOMYIA Bilimek.

Pholeomyia BILIMEK, Verh. zool.-bot. Ges. Wien, 1867, p. 903.

Rynchomilichia HENDEL, Wien. Ent. Zeitg., vol. 22, 1903, p. 250.

The species of this genus, which number 12 in Becker's paper already mentioned, are recognizable from those in the genus *Milichia* by the presence of bristles on the mesopleura, from *Paramilichia* by the geniculated and elongated proboscis, and from *Milichiella* by the absence of the incision in the posterior margin of the eye.

I have seen three species belonging to this genus from North America. Only one American species that I have seen can be correctly referred to *Milichia*, though the genus has generally appeared in out lists as including most of those in *Pholeomyia* and *Milichiella*.

SYNOPSIS OF SPECIES IN PHOLEOMYIA.

1. Mesonotum with three distinct dorso-centrals.....*indecora* Loew.
Mesonotum with two distinct pairs only..... 2.
2. All abdominal segments, except first, covered with silvery pollinosity.
leucogastra Loew.
- All segments not silvery dusted..... 3.
3. The entire abdomen opaque black, only a silvery spot on lateral margin of fifth segment.....*pseudodecora* Becker.
Abdomen otherwise marked..... 4.
4. First and second abdominal segments black, third to fifth with fore marginal bands, the one on third segment interrupted.....*robertsoni* Coquillett.
Third and fourth segments entirely silvery white, second concolorous, but with a large, black-brown central spot.....*leucozona* Bilimek.

PHOLEOMYIA INDECORA Loew.

Plate 4, fig. 1; plate 5, fig. 14.

Lobioptera indecora LOEW, Dipt. Amer. Sept. Ind. Cent., 8, species 94.

Milichia indecora (Loew), ALDRICH, Cat. N. A. Dipt., 1905, p. 651.

This is the largest and probably the most common species of the group with the costal incision. It may be known from any other

American species by the uniform black-brown color in both sexes and by its possession of three pairs of dorso-central bristles.

The specimens I have examined are from the following localities: Beverly, Massachusetts (Burgess); Franconia, New Hampshire (Mrs. A. T. Slosson); District of Columbia (collection Coquillett); Georgia and North Carolina (no other data); New York (E. B. Southwick); White Mountains, New Hampshire (Morrison); Texas (C. H. T. Townsend); Vieques Island, Porto Rico (A. Busck); and Frontera, Tabasco, Mexico (C. H. T. Townsend).

PHOLEOMYIA LEUCOGASTRA Loew.

Milichia leucogastra LOEW, Wien. Ent. Monatsch., vol. 5, 1861, p. 43.

Lobioptera leucogastra LOEW, Dipt. Amer. Sept. Ind. Cent., 8, species 95.

This species, which was originally described from Cuba, is represented by two specimens in the U. S. National Museum collection from Georgia (no other data). The male may be easily separated from *indecora* by the silvery white abdomen, and its larger size (2 mm.) readily separates it from *robertsoni*, which is the only other species with pollinose abdomen recorded from this country. I have seen one specimen of this species from Rosser, Texas, August 23, 1905 (F. C. Bishopp), and one from Victoria, Texas, April 1, 1907 (J. D. Mitchell).

PHOLEOMYIA ROBERTSONI Coquillett.

Milichia robertsoni COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, 1902, p. 187.

Represented in U. S. National Museum collection by the type specimen only. Length barely 1.5 mm. Locality: Inverness, Florida (Robertson).

PHOLEOMYIA LEUCOZONA Bilimek.

Plate 6, fig. 31.

Pholeomyia leucozona BILIMEK, Verh. zool.-bot. Ges. Wien, 1867, p. 903.

Rhynchomilichia præsecta BECKER, Ann. Mus. Nat. Hung., vol. 5, 1907, p. 525.

I have not seen this species which was described from caves at Cacahuamilpa, Mexico. The above synonymy is according to Hendel,¹ who has examined the type-specimen.

PHOLEOMYIA PSEUDODECORA Becker.

Rhynchomilichia pseudodecora BECKER, Ann. Mus. Nat. Hung., vol. 5, 1907, p. 524.

This species was described from specimens of both sexes, one male and three females, taken at Tifton, Georgia. The female lacks the silvery spot on fifth segment of abdomen. I have not seen the species.

PARAMILICHIA, new genus.

This genus is erected for the reception of *Milichia longiseta* Becker,² which was described from South America. The characters given in

¹ Wien. Ent. Zeit., vol. 30, 1911, p. 40.

² Ann. Mus. Nat. Hung., vol. 5, 1907, p. 530.

the table should serve to distinguish the genus from *Phleomyia*. Represented in the U. S. National Museum collection by one specimen from Nicaragua.

Genus ALDRICHIELLA Hendel.

Plate 6, figs. 25, 30.

Aldrichiella HENDEL, Wien. Ent. Zeitg., vol. 30, 1911, p. 35.

A single species belonging to this genus is known from America, namely, *A. agromyzina* Hendel. Locality: Brookings, South Dakota. According to Becker's description the species bears a superficial resemblance to *Agromyza scutellata* Fallen.

PARAMADIZA, new name.

The species *halteralis* Coquillett (*Desmometopa*) belongs to *Madiza* according to Hendel in the paper already cited under *Aldrichiella*. *Madiza* Fallen has as type *oscinina* Fallen, which is a chloropid. The European species *glabra* is congeneric with *halteralis*. Owing to the fact that no name is available for this genus I have to propose a new one. The type of this genus is *Paramadiza halteralis*, as indicated.

Genus PHYLLOMYZA Fallen.

Phyllomyza FALLEN, Dipt. Suec. Ochthid., 1823, 8, species 1.

Generic characters.—This genus may be distinguished from other *Milichinæ* by the very large third antennal joint in the male and by the exceptionally developed palpi in both sexes. *Paramyza*, which bears a rather close resemblance to this genus, has the outer cross vein absent, and *Agromyza laterella* Zetterstedt, which has the third joint enlarged, has the palpi normal and the postvertical bristles divergent. There is but one European species described so far, *P. securicornis* Fallen.

SYNOPSIS OF MALES KNOWN IN PHYLLOMYZA FALLEN.

1. Mesonotum with four pairs of distinct dorso-central bristles; male palpi not longer than height of head, moderately hairy; cheeks distinct. . . . *securicornis* Fallen.
Mesonotum with two pairs of distinct dorso-central bristles; male palpi distinctly longer than height of head, densely hairy; cheeks linear, almost absent.
hirtipalpis, new species.

PHYLLOMYZA SECURICORNIS Fallen.

Plate 5, fig. 17.

Phyllomyza securicornis FALLEN, Dipt. Suec. Ochthid., 1823, 8, species 1.

Agromyza securicornis MEIGEN, Syst. Besch., vol. 6, 1830, p. 171, species 13.

Agromyza flavitarsis MEIGEN, Syst. Besch., vol. 6, 1830, p. 107, species 13.

Agromyza morosa MEIGEN, Syst. Besch., vol. 6, 1830, p. 170, species 8.

Male and female.—Entirely shining black or black-brown, only the apices of femora, entire fore tibiæ, mid and hind tibiæ at bases and apices, entire tarsi on all legs, and halteres yellow.

Frons in both sexes distinctly broader than one-third the width of head; each orbit about one-fourth as broad as center stripe; orbits shining, center stripe opaque; five distinct orbital bristles present, the lower two directed slightly inward and backward, the upper three directed outward and backward; besides the bristles there is an irregular row of hairs on orbits nearer to eye margin; center stripe with two rows of incurved hairs which converge slightly toward anterior margin; the pair of bristles on anterior margins weak, divergent; antennæ in male very large, the third joint subquadrate and very densely pilose; in female the third joint much smaller and rounded at apex; arista with the basal two joints distinctly thickened, their junction with the terminal part slightly geniculated; pubescence on arista distinct; length of arista twice as long as breadth of third antennal joint in male, and about three times as long as breadth of third joint in female; face black, concave in profile, in both sexes somewhat produced at mouth margin; cheeks brownish, marginal bristles distinct, vibrissa not much differentiated; palpi black, as long as proboscis in male, slightly shorter in female, the surface bristles sparse; proboscis brown, chitinized. Mesonotum with four distinct pairs of dorso-central bristles, the front pair very close to anterior margin; the pair of bristles between the posterior pair of dorso-centrals distinctly differentiated from discal setulæ; basal pair of bristles on scutellum much weaker than apical pair. Abdomen with numerous surface setulæ, which are longer on the apices of segments. Legs covered with short hairs; mid tibia with distinct apical spurs, the other pairs without any distinct spurs. Wings clear; veins yellowish or brownish; subcostal vein very indistinct; first costal division about one-fifth as long as second; second and third veins slightly convergent, third and fourth slightly divergent at apices; outer cross vein at slightly beyond wing middle, at little more than its own length from margin of wing, and at distinctly more than its own length from inner cross vein. Halteres yellow.

Length.—2-2.5 mm.

The only specimens of this species that I have seen from America are one female from the Burgess collection, taken at Beverly, Massachusetts, October 9, 1871, and one in C. W. Johnson's collection from Orrs Island, Maine. There are two males and one female in the collection from Italy (Prof. M. Bezzi) with which the American specimens agree so closely as to leave no doubt as to their identity.

PHYLLOMYZA HIRTIPALPIS, new species.

Plate 5, fig. 18.

Male.—Frons black; center stripe opaque, the bristles on it very weak, the stripes on which they are situated not shining; orbits and ocellar triangle shining; upper three orbital bristles outward curved,

the lower two curved inward; orbits and anterior margin of center stripe with numerous rather long hairs; head in profile as figure 18, Plate 5; antennæ, arista, proboscis, and palpi black, apex of proboscis yellowish; the pilosity on antennæ very distinct, arista distinctly hairy, palpi hairy; eye facets exceptionally large; occiput very narrow above. Mesonotum shining, two pairs of dorso-centrals present, the pair of bristles between the posterior pair hardly distinguishable from the discal setulæ; pleuræ glossy black-brown; scutellum colored as disk of mesonotum, the basal pair of bristles half as large as the apical pair. Abdomen shining black; surface of segments with numerous hairs. Legs yellow, all coxæ, femora except extreme bases and apices, and the mid and hind tibiæ on middle broadly blackened; all legs with rather distinct hairs. Wings vitreous; costa distinctly haired; veins 2-3 convergent on outer portions, 3-4 divergent; third vein ending in wing tip; outer cross vein at about its own length from end of fifth vein; penultimate section of fourth vein two-fifths as long as last section. Halteres yellow.

Length.—1 mm.

Type.—Cat. No. 15746, U.S.N.M.

Locality.—Plummers Island, Maryland, August 10, 1912 (W. L. McAtee).

PHYLLOMYZA APPROXIMATA, new species.

Plate 5, fig. 19.

Two females, one taken in Washington, District of Columbia, June 4, 1912, by the same collector, and another, "D. C.," coll. Coquillett? May, which I consider belong to a different species, differ in having the profile of head as in figure 19, Plate 5; in having the outer cross vein at nearly three times its own length from end of fifth vein, the inner and outer cross veins of nearly equal length; and the last section of fourth vein about five times as long as the penultimate section.

It is very seldom that such differences as are here noted are found in the sexes of the same species, and though in this genus the tendency to sexual difference is considerable I consider it the better course to adopt the male as the type of *hirtipalpis*, and give to the females the species name *approximata*.

Type.—Cat. No. 15751, U.S.N.M.

I have, since writing the above, seen two females of this species taken at Plummers Island, Maryland, by W. L. McAtee.

Williston's¹ description of *Phyllomyza magnipalpis* is as follows:

Phyllomyza magnipalpis, n. sp.

Female.—Head deep black. Front broad, large, the narrow orbits, on which are placed the lateral rows of bristles, subshining. Third antennal joint very large,

¹ Trans. Ent. Soc. Lond., 1896, p. 443.

the arista, which springs from its superior angle, finely pubescent. Face excavated, retreating in profile. Palpi very large, projecting; proboscis small, rather slender. Thorax deep black; mesonotum shining, with black hair. Scutellum large, trapezoidal, with a stout bristle on each apical angle. Abdomen black, with black hair, not shining; in shape, short ovate, the five segments of nearly equal length. Legs black, the immediate tip of femora, the front tibiæ, the middle tibiæ in part and all the tarsi yellow. Wings nearly hyaline; basal cells small but complete; submarginal cell narrowed at the extremity, its costal margin only about half the length of that of the first posterior tip of the wing; penultimate section of the fourth vein less than one third the length of the ultimate section.

Length $1\frac{1}{2}$ mm.

One specimen.

St. Vincent, West Indies.

There is nothing in the foregoing description to distinguish this species from either of the other two, except in its possession of only two scutellar bristles, which I am certain is inaccurate.

EUCHLOROPS, new genus.

Generic characters.—Frons flattened, slightly produced in front; ocellar triangle distinct; central rows of bristles distinct, but sometimes consisting of only two pairs near to anterior margin; post-vertical bristles slightly incurved; antennæ normal in shape, arista bare; vibrissæ weak, but distinct; proboscis and palpi normal; humerus with two bristles; dorso-centrals on mesonotum strong; four scutellar bristles; meopleura bare; no strong bristles on sternopleura, those that are present weak, and hair-like; abdomen five segmented, the first indistinct; legs normal in shape and length; the preapical bristles absent.

Type of genus.—*Euchlorops vittata*, new species.

EUCHLOROPS VITTATA, new species.

Plate 4, fig. 8; plate 6, figs. 24, 32.

Female.—Frons yellow, viewed from above as in figure 24, Plate 6, the strong orbital bristles black, the hairs, confined to anterior half, pale yellow; outline of ocellar triangle, and ocellar region black, or black-brown; antennæ yellow, third joint black; arista black, pale at base; face and cheeks entirely yellow, hairs and vibrissæ yellowish white; head in profile as figure 32, Plate 6; proboscis and palpi black. Mesonotum yellow, with three longitudinal stripes, the center one commencing on anterior margin and finishing rather wedge-shaped before reaching posterior margin; the side stripes beginning at behind humeri and of almost equal width on their entire length, finishing at just in front of posterior pair of dorso-centrals; the four pairs of dorso-centrals black, and of almost equal strength; no bristles between the posterior pair; the short discal setulæ yellow; humeral and other marginal bristles black, and of moderate length;

pleuræ yellow, a spot below humeri, another on lower anterior half of mesopleura, the lower portion of sternopleura, a spot between mid and hind coxæ, and a vertical streak below wing base black; no black pleural bristles present; scutellum yellow, darkened laterally at base; the bristles and several short discal setulæ black, some other weaker discal setulæ yellow. Abdomen brownish yellow, glossy; surfaces of segments with scattered, short, pale setulæ; posterior margin of last segment and postero-lateral margins of other segments with a few black bristles. Legs yellow, all femora and tibiæ browned on the middle; tarsi brown; surfaces of all legs with numerous short yellow hairs, intermixed with which, on the dorsal surfaces, are regular longitudinal rows of short black setulæ; no distinct tibial bristles present, and those on the ventral surfaces of femora weak. Wings clear, basal portions of veins yellowish; costa from end of first vein, third vein from before cross vein, and fifth vein almost from its base, brown; costa slightly interrupted at a little before end of first vein; fourth vein indistinct beyond outer cross vein; for venation see figure 8, Plate 4. Halteres yellow, knobs white.

Length.—1.5 mm.

Type.—Cat. No. 15747, U.S.N.M.

One female: Wellington, Kansas, hibernating in clump of *Andropogon scoparius* January, 1913 (H. E. Smith).

EUCHLOROPS SIMILIS, new species.

Female.—Frons reddish yellow, ocellar triangle subshining, ocellar region and margins of triangle black-brown; head viewed from above almost as in *vittata*, but slightly more elongate, the hairlike surface bristles rather sparse, black, no pale hairs present; antennæ brown, basal two joints and base of third yellowish, size and shape as in *vittata*; clypeus black; face and cheeks yellow, profile almost as in previous species, but upper mouth margin slightly more produced; palpi yellow; proboscis yellow, normal in shape. Mesonotum yellow, subshining, three broad longitudinal vittæ present; only one pair of strong, widely placed, dorso-centrals present, disk with numerous irregularly arranged, black, setulose hairs; lateral bristles strong; pleuræ yellow, marked with black as in *vittata*, but the markings larger and not so well defined; scutellum yellow, with a black mark on either side; marginal bristles subequal, discal hairs black, setulose. Abdomen shining black-brown; segments subequal, except first, which is shortened; disk of all segments with pale, scattered hairs, lateral margins, and apex of fifth (last) segment with black bristles. Legs reddish yellow, femora slightly darkened on middle; tibiæ darkened from near base, becoming black at apices, tarsi black; fore femora with two black bristles on about middle of postero-dorsal surface; surfaces of all legs with short black hairs, with which are intermixed

numerous pale hairs. Wings smoky gray; ventation similar to that of *vittata*, except that the penultimate section of fourth vein is slightly longer than the penultimate section of third. Halteres yellow.

Length.—1.5 mm.

Type.—Cat. No. 15748, U.S.N.M.

Locality.—Springer, New Mexico (C. N. Ainslie), Webster No. 5554. One female.

The two species described herewith are very close in general appearance, but may be separated readily by the number of dorso-central bristles.

Genus PARAMYIA Williston.

Paramyia WILLISTON, Kans. Univ. Quart., vol. 6, 1897, p. 1.

This genus was erected by Williston for the reception of *P. nigra*, new species. In most respects it is very close to *Phyllomyza*, although Williston compared it with *Phytomyza*. The genus belongs without doubt to the *Milichinæ* and Loew's species *Phyllomyza nitens* is congeneric with *nigra* Williston. This is the only genus so far described in *Milichinæ* that has the posterior cross vein absent. I give a copy of Williston's description of *nigra* and describe *nitens* from specimens in the U. S. National Museum collection.

PARAMYIA NIGRA Williston.

Paramyia nigra WILLISTON, Kans. Univ. Quart., vol. 6, 1897, p. 2.

Female.—Black. Front opaque, with a long shining triangle, reaching nearly to the front border. Face more yellowish; in some reflections silvery on the sides. Proximal portion of the proboscis piceous; distal portion yellowish. Thorax shining; mesonotum with rather abundant, short, black hair. Abdomen less shining than the mesonotum. The knees narrowly, the front and middle tibiæ and tips of the hind tibiæ, and all the tarsi yellow. Wings tinged with brownish. Length 2½ mm.

One specimen, Grenada, H. H. Smith.

In most respects Williston's description of his genus fits *nitens* but he used some characters in defining the genus which are of only specific value as for instance the number of scutellar bristles, and their position, as well as the course of the wing veins. These characters might have been used to better advantage in his description of the species.

PARAMYIA NITENS Loew.

Plate 4, fig. 7.

Phyllomyza nitens LOEW, Dipt. Amer. Sept. Ind. Cent., 8, 1861, species 82.

Male and female.—Black, legs brown, knees and tarsi yellowish.

Frons slightly over one-half as wide as head in male, distinctly wider in female, posteriorly the sides are divergent; orbits narrow, glossy black, generally four orbital bristles present, the lower two pairs incurved, the upper pairs curved outward; ocellar region slightly raised, glossy black; ocellar triangle glossy black, narrow,

extending to anterior margin of center stripe, center stripe dull black; the hairlike bristles along the sides of the ocellar triangle, and on anterior margin of frons distinct; postvertical bristles incurved; antennæ of male shaped much as in the male of *Phyllomyza securicornis*, the third joint truncate at apex, its length distinctly greater than its breadth; in the female the third joint is rounded and the antennæ are of normal size; arista pubescent, in male its length does not exceed $1\frac{1}{2}$ times that of the third antennal joint, in female its length is about equal to from its base to second uppermost orbital bristle; cheeks narrow, marginal bristles weak, anterior margins of cheek produced, vibrissa slightly differentiated; proboscis chitinated, its entire length equal to about three times the height of head, geniculated; palpi large, spatulate, sparsely bristled; occiput almost invisible on upper half. Mesonotum glossy black; two pairs of dorso-centrals present, the pair of bristles between the posterior pair distinct; pleuræ glossy black; squamæ brown; scutellum glossy black; the basal pair of bristles much weaker than the apical pair. Abdomen glossy and like mesonotum covered with short black setulæ. Legs thickly covered with short setulose hairs. Wings clear, costa, basal part of veins, and veins 1-3 brown, the others indistinct, venation as figure 7, Plate 4. Halteres black.

Length.—1-1.5 mm.

Originally described from Pennsylvania (Osten Sacken). Specimens in U. S. National Museum collection are from District of Columbia (collection Coquillett); Peaks of Otter, Virginia, July 26, 1906, (W. Paine); White Mountains, New Hampshire, July, (S. H. Scudder); Southern Illinois, (Robertson); and Kaslo, British Columbia, (R. P. Currie).

Genus MEONEURA Rondani.

Meoneura RONDANI, Prodr., vol. 1, 1856, p. 128.

Anisoneura LIOY, Atti Inst. Veneto, ser. 3, vol. 10, 1864, p. 1314.

Psilidotus primus BECKER, Mitth. Zool. Mus. Berlin, vol. 2, pt. 3, 1903, p. 192.

This genus may be distinguished from *Agromyza* by possession of the following characters: Frontal triangle distinct; frons with two anterior marginal bristles at center; lower two pairs of fronto-orbital bristles incurved, upper two pairs curved outward (pl. 5, fig. 11); vibrissæ strong, the anterior pair consisting of an upper and lower incurved bristle on facial ridge, the others carried backward in a diagonal line from lower anterior angle to posterior upper angle at near to edge of eye (pl. 5, fig. 10). There is also an additional bristle on lower part posteriorly; antennæ as in *Agromyza*, arista slightly pubescent; wings with costa to end of third vein; fourth vein indistinct beyond cross vein; costa ciliated with short, but distinct bristles to end of first vein (pl. 4, figs. 2, 3).

TABLE OF SPECIES.

1. Larger species $1\frac{1}{2}$ –2 mm.; fore femora with a long, curved bristle at about apical third on the postero-ventral surface (pl. 6, fig. 27).....*vagans* Fallen.
 Smaller species barely 1 mm.; fore femora without a clearly differentiated bristle as above, the row on this surface graduated in length (pl. 6, fig. 26)*lacteipennis* Fallen.

MEONEURA VAGANS Fallen.

Plate 5, figs. 10, 11; plate 6, fig. 27.

Agromyza vagans FALLEN, Dipt. Suec. *Agromyza*, 1823, 5.7

? *Agromyza obscurella* FALLEN, Dipt. Suec., *Agromyza*, 1823, 5.7.

? *Agromyza pectinata* MEIGEN, Syst. Besch., vol. 6, 1830, p. 179, species 4.1.

? *Agromyza infusca* MEIGEN, Syst. Besch., vol. 6, 1830, p. 184, 56.

Agromyza tritici FITCH, 2nd Rept. Nox. Ins. N. Y. State, 1856, p. 303.

Meoneura obscurella (Fallen) RONDANI, Prodr., vol. 1, 1856, p. 128, pls. 4, 5, 6, figs. 3, 10, 11, 27.

Male and Female.—Black, distinctly shining. Frontal triangle glossy, the anterior margin of frons distinctly reddish-yellow; sometimes this color is confined to anterior margin, at others the anterior half of frons is reddish, and more rarely the pale color extends almost to vertex, but the ocellar triangle is always black. Face brownish-yellow, excavated, with a slight central keel and the mouth margin slightly produced, antennæ brown, cheeks brown, paler anteriorly; besides the two anterior vibrissæ there are four to five bristles forming the diagonal row across the cheek; above this series of bristles the cheek is subopaque, below it glossy and slightly granulose; proboscis and palpi brown, normal in size. Mesonotum slightly gray dusted; three pairs of dorso-central bristles present, the anterior pairs reduced in size; surface with numerous short setulose hairs. Abdomen subshining; segments brownish toward bases; all segments with scattered surface hairs, the most distinct being the preapical row on each segment; female ovipositor not chitinized, papillalike; male hypopygium of moderate size, glossy brown. Legs brown, the tarsi paler; all legs with short, pale brown hairs; besides the long bristle on anterior femur there is one present on the apical third of the antero-ventral surface of the hind femur; tarsi rather thickly covered with pale, almost white, hairs on the ventral surface. Wings generally whitish, veins yellow or pale brown, costa interrupted at before tip of first vein, to this part furnished with a double row of setulæ, which are longer than the diameter of the costal vein; length from humeral vein to end of first about one-third as long as next costal division; inner cross vein at just beyond end of first vein, outer cross vein at about one and one-half times its own length from inner; fourth vein indistinct from outer cross vein. Halteres milk white.

Length.—1.5–2 mm.

I have no hesitation in placing *tritici* Fitch as a synonym of the specimens in collection, from Europe, standing as *obscurella* Fallen.

I have before me the type-specimens of Fitch's species and they agree in every particular with the European specimens. The species *lacteipennis* Fallen (*Agromyza*) is congeneric with *obscurella* and as this species is the type of Lioy's genus *Anisoneura* that genus becomes a synonym of *Meoneura*. Becker described the genus *Psalidotus* with *P. primus* as type ¹ and in 1905 Becker and Bezzi ² gave this species as a synonym of *obscurella*, making the genera synonymous. Becker's figure gives only a single bristle on the mouth margin and he does not mention the diagonal row on the cheek so prominent in *obscurella*, but his description fits otherwise and probably he overlooked this feature.

The specific synonyms cited are, I believe, correct, though I have not material at hand for comparison.

The localities for specimens in collection are New York (Fitch's types, four specimens and pupal cases), reared from wheat, and two specimens—Cambridge, Massachusetts (Burgess?). The European specimens are from Holland and were identified by de Meijere. I have seen one specimen from Boston, Massachusetts (C. W. Johnson).

MEONEURA LACTEIPENNIS Fallen.

Plate 4, fig. 2; plate 6, fig. 26.

Agromyza lacteipennis FALLÉN, Dipt. Suec. *Agromyza*, 1823, 4.4.

Anisoneura lacteipennis (Fallen) LIOY, Atti. Inst. Veneto, ser. 3, vol. 10, 1864, p. 1314.

Male and female.—Similar in coloration to the foregoing, but considerably smaller. In the coloration of the frons I find that the females have it more distinctly yellow than the males, though my series is not large enough to allow one to form a definite opinion as to whether this is the rule or not. The fore femur has a row of distinct hair-like bristles on the postero-ventral surface, but the very long bristle present in *vagans* is not noticeable in this species. The other characters of the species are almost identical. Costa less distinctly spinose at base than in *obscurella*.

Localities of specimens examined: One specimen, Saldovia, Alaska (Harriman Alaska Expedition, Kincaid); two specimens, Kaslo, and two specimens, London Hill Mine, Bear Lake, British Columbia (R. P. Currie).

Genus HEMEROMYIA Coquillett.

Hemeromyia COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, 1902, p. 190.

This genus was erected for the reception of a single species, *obscura* Coquillett. The postvertical bristles in the type are very small and slightly divergent, but, owing to the presence of a pair of bristles on the anterior margin of frons and the strong mouth-marginal bristles,

¹ Mitth. Zool. Mus. Berlin, vol. 2, pt. 3, 1903, p. 192.

² Kat. d. Palaar. Dipt., vol. 4, p. 239.

which extend above the level of the epistome, I consider its position in the Milichinæ more nearly the correct one than if it were retained in the Agromyzinæ.

HEMEROMYIA OBSCURA Coquillett.

Hemeromyia obscura COQUILLET, Journ. N. Y. Ent. Soc., vol. 10, 1902, p. 190.

Female.—Shining black, anterior margin of frons narrowly, face and cheeks, third joint of antennæ on lower half and tarsi yellow. Halteres with milky-white knobs.

Frons one-third as wide as head at anterior margin, at posterior ocelli one-half as wide as head; surface of frons granulose; ocellar triangle glossy, distinct; center stripe opaque, bare except for the pair of bristles on anterior margin; orbits glossy on upper half, four bristles present; antennæ small, half hidden below the anterior margin of frons, which is slightly protuberant, third joint rounded, covered with very short, white pile; arista swollen at base, bare, its length short of the breadth of frons at anterior margin; face concave; cheeks higher posteriorly than anteriorly, the shape much as in *Meoneura*, but the bristles much weaker on the diagonal ridge, the upper bristle, in front, midway between the apex of antennæ and lower margin of cheek, and in line with lower margin of eye; proboscis fleshy (palpi retracted); occiput invisible on upper half. Mesonotum with surface finely granulose; four pairs of dorso-centrals, no other setulæ on center of disk; mesopleura and sternopleura with 2-3 bristles each; scutellum as disk of mesonotum, the basal pair of bristles weaker than the apical pair. Abdomen with dorsum bare, the setulæ confined to the lateral margins and the apex. Legs with femora slightly thickened, fore femur with 2-3 long bristles on apical half of postero-vertical surface, and a row of shorter ones from these to base; other femora with shorter bristles on ventral surfaces; no tibial bristles present; apical spurs weak. Wings clear, veins black-brown; inner cross vein at near to wing middle, at distinctly beyond end of first vein, and at about one-third from apex of discal cell; outer cross vein at slightly more than its own length from inner, and about same length from end of fifth vein; third and fourth veins subparallel on last sections; sixth vein very distinct, but not reaching wing margin.

Length.—1.5 mm.

Redescribed from type-specimens.

Locality.—Las Vegas, Hot Springs, New Mexico (H. S. Barber). I have also seen two specimens taken by Mitchell and Cushman on Chisos Mountains, Brewster County, Texas, June, 1908.

HEMEROMYIA NITIDA, new species.

Plate 6, fig. 21.

Female.—Glossy black; bases of tarsi and apices of tibiæ yellow; halteres yellow; wings whitish, veins yellow.

Head similar in shape to *H. obscura*, the frons slightly protruding and the face concave; the antennæ are half hidden under the frons. Frons almost twice as wide as either eye, sides slightly convergent anteriorly, lower two orbital bristles directed inward, upper two directed outward; antennæ rather larger than in *obscura*, arista similar to that of *obscura*; cheeks over one-third as high as eye, the diagonal line of bristles strong and running much closer to eye margin than in *obscura*; palpi very small. Mesonotum rather more strongly bristled than *obscura*, and between the dorso-centrals there are several irregular rows of short setulæ; scutellar bristles subequal. Abdomen as in *obscura*. Legs as in that species, but the ventral femoral bristles are stronger and there is one strong bristle on the hind femur at near apex on the antero-ventral surface. Wings with inner cross vein at little beyond end of first vein and at middle of discal cell; outer cross vein at its own length from apex of fifth and one and one-half times that length from inner; sixth vein less distinct than in *obscura*.

Length.—1.5 mm.

Type.—Cat. No. 15749, U.S.N.M.

Locality.—Florissant, Colorado (T. D. A. Cockerell).

The presence of discal setulæ on mesonotum, the hind femoral preapical bristle, and the different venation should readily separate this species from *obscura* Coquillett.

Genus TETHINA Haliday.

Tethina HALIDAY, Ann. Nat. Hist., vol. 2, 1839, p. 188.

This genus may be distinguished from *Rhincæssa* Loew by the character of frons as given in the table of genera, and by the absence, or partial absence, of the cross vein closing base of discal cell. I consider that the genus properly belongs to the Ephyræidæ and not to the Agromyzidæ, though whether the species *rostrata* Hendel is really congeneric with the other two or not, I can not say for certain. I include *Tethina* in my paper only because it has been placed in Agromyzidæ by other authors. It can not belong here according to my definition of the family Mielidinae, having no central frontal setulæ.

SYNOPSIS OF SPECIES.

1. Face very distinctly produced in profile; proboscis elongated (fig. 28)
rostrata Hendel.
- Face not much produced in profile; proboscis normal..... 2.

2. Legs except fore coxæ, knee joints and bases of tarsi black; outer cross vein of wing at less than its own length from end of fifth vein.....*coronata* Loew.
 Legs yellow, femora black gray, all tibiæ brownish on middle, tarsi with apical joint blackened; outer cross vein at three times its own length from end of fifth vein.....*parvula* Loew.

TETHINA ROSTRATA Hendel.

Tethina rostrata HENDEL, Wien. Ent. Zeitg., vol. 30, 1911, p. 41.

This species was described by Hendel from specimens sent him by Professor Aldrich from Pender, Idaho, and Friday Harbor, Washington. I have not seen the species, which is unrepresented in the U. S. National Museum collection.

TETHINA CORONATA Loew.

Rhincæssa coronata LOEW, Dipt. Amer. Sept. Ind. Cent., 6, 1865, species 98.

This species was described from Georgia by Loew. I have seen specimens from Logansport, Louisiana (E. S. Tucker); Longview, Texas (E. S. Tucker); and Durango, Mexico (F. C. Bishopp). This species is very close to *T. cinerella* Haliday, differing in color of the fore coxæ and in venation, that of the European species being nearer to the venation of *parvula*.

TETHINA PARVULA Loew.

Rhincæssa parvula LOEW, Dipt. Amer. Sept. Ind. Cent., 8, 1869, species 81.

Originally described from Newport, Rhode Island. I have seen three specimens from Galveston, Texas (W. D. Pierce). Taken on *Tamarix gallica*.

Genus RHINCÆSSA Loew.

Rhincæssa LOEW, Wien. Ent. Monatsch., vol. 6, 1862, p. 175.

This genus though bearing a superficial resemblance to *Tethina* really belongs to the Milichinæ. The only described species occurring in North America which is referable to this genus is I consider *albula* Loew. I have seen several specimens of this from Galveston, Texas (E. S. Tucker). There is another species which occurs in Texas the description of which is given herewith. *Anthomyza cinerea* Williston, which Hendel suggests is a species of *Rhincæssa*, may belong here, but the name is preoccupied by *cinerea* Loew (1862), so that, even should it be distinct from *albula* Loew, or identical with the one now described, the name can not stand. Hendel states in his paper¹ "*Xanthopoda* Williston wahrscheinlich zu *Tethina*." I have not seen either of Williston's species, which were described from St. Vincent, West Indies.

RHINCÆSSA ALBULA Loew.

Plate 6, fig. 22.

Rhincæssa albula LOEW, Dipt. Amer. Sept. Ind. Cent., 8, 1869, species 80.

This species was originally recorded from Newport, Rhode Island. The series I have examined was taken at Galveston, Texas, March 17, 1908 (E. S. Tucker).

¹ Wien. Ent. Zeitg. vol. 30, 1911, p. 42.

RHICNÆSSA TEXANA, new species.

Female.—Black-gray, with pale gray dusting, opaque. Head with frontal stripe reddish yellow, orbits and triangle whitish, face, cheeks, and antennæ yellow, upper margin of third antennal joint brown; cheeks silvered on upper half; palpi yellow, proboscis brownish yellow. Mesonotum slightly brownish on disk, and at some angles with faint indications of two brown stripes. Second abdominal segment almost entirely yellow, other segments with apices narrowly pale. Legs yellow, fore femora distinctly blackened, posterior pairs browned on middle, last two tarsal joints blackened. All bristles black or brown.

Frontal triangle very short, ocellar bristles widely divergent; orbits narrow, the inner orbital row of setulæ regular, of moderate strength, incurved, the orbital bristles four in number; cruciate frontal setulæ consisting of about four pairs of moderate length; antennal arista hairlike, short, not longer than anterior width of frons, bare; eyes about one-third higher than long; cheeks about one-third as high as eye; marginal cheek bristles of moderate strength, upturned, in a single row, the vibrissa not differentiated. Mesonotum with four pairs of post-sutural, and two pairs of presutural dorso-centrals, between which are situated about four rows of short black setulæ. Legs with surfaces covered with numerous black setulæ, which are bristle like on the ventral surfaces of all femora towards apices. Wings clear, veins yellowish; veins 2-3 divergent, 3-4 slightly convergent apically; outer cross vein at nearly twice its own length from apex of fifth. Halteres yellow.

Length.—2 mm.

Male.—Similar to female though smaller, darker in color, particularly that of the femora, and wing veins. The outer cross vein is at more than twice its own length from end of fifth vein.

Type and allotype.—Cat. No. 15807, U. S. N. M.

Type-locality.—Corpus Christi, Texas, April 12, 1906 (F. C. Pratt). Locality of paratype: St. Augustine, Texas, March 22, 1908 (E. S. Tucker).

This species may be distinguished from *albula* Loew, by its darker coloration, and the fact that all the bristles are brown, or black, and not yellow, or white, as in *albula*. *Rhincnæssa cinerea* Loew, of Europe, is closely related to this species, but has only two rows of setulæ between the dorso-centrals on the mesonotum. It has also some other minor differences from *texana*.

PARALEUCOPIS, new genus.

This genus comes very close to *Leucopis* Meigen, but may be distinguished from it by the eyes being distinctly longer than high; the third antennal joint disklike; the second joint of arista but slightly longer than its diameter; the mesonotum having only one

pair of dorso-centrals; the costal vein of wing having closely placed, short, black thorns from end of first vein to apex of second, where they become indistinct; first costal division with the normal fringe and only one black thorn at apex of subcostal vein; subcostal vein indistinct, but complete; anal cell complete and distinct, the sixth vein straight, reaching two-thirds to wing margin; costa reaching to fourth vein.

Type of genus.—*Paraleucopis corvina*, new species.

PARALEUCOPIS CORVINA, new species.

Male.—Metallic blue-black; antennæ yellow, sometimes slightly browned; legs yellow, coxæ except apices, femora except bases and apices narrowly, and sometimes middle of hind tibiæ browned or blackened. Wings whitish, veins yellow; halteres yellow.

Head in profile; frons flattened, descending toward front, face receding, slightly concave; frons, viewed from above, almost parallel-sided, glossy black, with a brownish tinge anteriorly, surface with sparse very short pale hairs, breadth barely more than equal to either eye; antennæ of rather small size; arista hairlike, bare; cheeks high, equal at posterior margin, where they are highest, to over one-half the height of eye at highest part, surface with hairs similar to frons; palpi brown; eyes bare. Mesonotum with very sparse dark setulæ on the disk besides the one pair of dorso-centrals; the one bristle present on the sternopleura is situated close to the upper posterior angle and is difficult to see owing to the fact that it is upturned and lies very close to the surface; squamæ white; scutellum arched, rounded, four equally strong marginal bristles present. Abdomen subopaque on basal two segments, highly glossy on apical segments, surface hairs pale. Legs stout; mid tibiæ with an apical, black, straight spur; all tarsal joints except last one with black bristles at apices on under surface; claws black. Inner cross vein of wing at slightly beyond end of first vein and at slightly beyond middle of discal cell; outer cross vein at about its own length from end of fifth vein; last section of fourth vein two and one-half times as long as penultimate section; third and fourth veins convergent, third ending in wing tip.

Length.—1–5 mm.

Type.—Cat. No. 15755, U.S.N.M.

Female.—Similar to male in coloration and chætotaxy.

Allotype and paratypes.—Same number as type.

Locality.—Kerr Ranch, New Mexico, on *Yucca* species, April 23, 1910 (J. D. Mitchell). One specimen marked "From Raven's nest," same locality, has date 5-4-'10, by the same collector. There are in all 14 specimens in the series.

A single specimen taken by H. Pinkus at Dallas, Texas, May 6, 1910, agrees with the type series.

Genus ACROMETOPIA Schiner.

Acrometopia SCHINER, Wien. Ent. Monatschr., vol. 6, 1862, p. 434.

Oxyrhina pp. ZETTERSTEDT (not Meigen), Dipt. Scand., vol. 5, 1846, p. 1953.

Acrometopa ALDRICH, Cat. N. A. Dipt., 1905, p. 653 (*lapsus*).

This genus was originally described from Europe, but two American species have been referred to it by Coquillett. The figure of the head (fig. 16, pl. 5) should serve to distinguish the members of this genus from other Ochthiphilinae.

ACROMETOPIA PUNCTATA Coquillett.

Plate 5, fig. 16.

Acrometopia punctata COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, 1902, p. 185.

The abdomen of this species has a distinct brown dot at base of all the discal setulae, and the cell between second and third veins from above outer cross vein to its base is clear. The type-specimen was taken by H. K. Morrison in southern Georgia.

ACROMETOPIA MACULATA Coquillett.

Acrometopia maculata COQUILLETT, Journ. N. Y. Ent. Soc., vol. 10, 1902, p. 185.

This species has the spots at bases of the abdominal discal setulae much less distinct, but there are two distinct, rounded spots on the anterior margin of each segment, and the cell referred to in foregoing species has three narrow brown cross bands between the outer cross vein and the base of cell. The type-specimen was taken by August Busck in Baracoa, Cuba.

Nothing is known of the early stages of either of our species, which are represented in the U. S. National Museum collection only by the type-specimens.

Genus PHYTOMYZA Fallen.

PHYTOMYZA MAJOR, new species.

Female.—Yellow, subshining. Ovipositor brownish or blackish. Wings clear, veins yellowish, all veins distinct, but 1-3 thicker than 4-6. Bristles black.

Frons about twice as wide as either eye; orbits broad, one-half as wide as frontal stripe; upper two orbital bristles situated on near to inner margin of orbit; lower three on about center; in addition to these bristles there is an irregular row of short hairs between them and the eye margin; face concave, center raised longitudinally, but not sharply keeled; antennae of moderate size, third joint rounded, not much longer than second, pilose; second joint with a series of black hairs on apical margin; arista with basal joints elongated and thickened; pubescence short, but thick; eye almost as long as high; cheek slightly over one-half as high as eye; marginal bristles of mod-

erate length, vibrissa well differentiated; occiput linear. Mesonotum with 4 pairs of dorso-centrals and in one specimen with slight indications of longitudinal vittæ; disk with sparse, short black setulæ; scutellum with four bristles. Abdomen: All segments with numerous short, black surface hairs, longer on lateral margins; ovipositor glossy, brownish or blackish, as long as, or slightly longer than, last abdominal segment. Legs with apical tarsal joint darkened, and all surfaces covered with short black setulæ; hind femur thickened slightly; hind tibia with apical half thickened somewhat. Wings with first costal division one-half the length of second; third about one-fifth as long as second, and one-half as long as fourth; costa extending slightly beyond end of third vein; second vein slightly waved; third straight; fourth straight, ending slightly behind wing tip; sixth vein not reaching wing margin.

Length.—4.5 mm.

Type.—Cat. No. 15809, U.S.N.M.

Locality.—Ungava Bay, Labrador (L. M. Turner), with the type in another female in rather poor condition.

PHYTOMYZA NITIDULA, new species.

Female.—Shining black. Squamæ and halteres whitish. Wings whitish, veins 1-3, and costa, black.

Frons parallel-sided, barely one-third wider than either eye; center stripe opaque; four orbital bristles present, the upper pair strongest; antennæ of moderate size, third joint with a short, thornlike production at upper angle of apex; arista threadlike, bare, slightly longer than breadth of frons; face in profile slightly concave, receding toward mouth; eyes distinctly higher than long; cheeks narrow at anterior margin, at posterior margin less than one-third as high as eye; occiput distinct; marginal cheek bristles distinct; vibrissa not much differentiated. Mesonotum (rather rubbed in type) with 3 pairs of dorso-centrals of moderate length, the posterior pair much the strongest; disk covered with short black setulæ; scutellum with four bristles. Abdomen broadly ovate; surface of segments finely granulose; all segments with short, scattered, black hairs, which are longest on lateral and posterior margins of apical two segments. Legs normal. Wings with costa falling almost as far short of apex of fourth vein as length of second costal division; first costal division one-fourth shorter than second; second twice as long as third; veins 2-3 divergent; almost straight; fourth vein ending in wing tip; veins 4-6 indistinct.

Length.—1.25 mm.

Type.—Cat. No. 15808, U.S.N.M.

Locality.—Holtville, California (V. L. Wildermuth), Webster No. 6149.

PHYTOMYZA LACTEIPENNIS, new species.

Female.—Entirely black, subshining; halteres yellow, knobs white; tarsi yellowish, darkened at apices. Wings milk white, costa and third vein brownish yellow, first and second veins yellow, the other veins indistinct.

Frons with center stripe opaque, the narrow orbital stripes, and ocellar region glossy; breadth of frons one-third the width of head, the sides slightly divergent posteriorly; orbits in type-specimen denuded of bristles, but evidently normally with three pairs present; face concave in profile, lower margin slightly produced; cheeks narrow anteriorly, much broadened posteriorly, at broadest part one-third as high as eye; antennæ small, third joint with an acute upper angle at apex, but not so distinctly produced as in *Cerodontha*; arista bare, distinctly swollen at base, the terminal section threadlike; palpi small, bare, black; proboscis brown, of normal shape. Mesonotum with slight whitish pollinosity; three pairs of dorso-centrals present, the anterior pair weak; disk with numerous short setulæ; no distinctly differentiated bristles between the posterior pair of dorso-centrals; pleuræ with the normal bristles; scutellum with four subequal marginal bristles, disk bare. Abdomen shining; lateral margins of all segments with bristles, the last segment with noticeably long post-marginal bristles; ovipositor glossy black. Legs short, their surfaces with very short black hairs. Wings with first and second costal division subequal, third distinctly, but not greatly, shorter than second, third vein ending well in front of wing tip.

Length.—1.5 mm.

Type.—Cat. No. 15750, U.S.N.M.

Locality.—Mesilla Park, New Mexico (C. N. Ainslie), Webster No. 5050.

EXPLANATION OF PLATES.

PLATE 4.

- Fig. 1. Wing of *Pholeomyia indecora*.
2. Wing of *Meoneura lacteipennis*.
3. Wing of *Meoneura vagans*.
4. Wing of *Napomyza lateralis*.
5. Wing of *Cryptochætum iceryæ*.
6. Wing of *Eusiphona mira*.
7. Wing of *Paramyia nitens*.
8. Wing of *Euchlorops vittata*.

PLATE 5.

- Fig. 9. Head of *Desmometopa m-nigrum*.
10. Head of *Meoneura vagans* (side view).
11. Head of *Meoneura vagans* (dorsal view).
12. Head of *Milichiella lacteipennis*.
13. Head of *Traginops irrorata*.
14. Head of *Pholeomyia indecora*.
15. Head of *Odinia maculata*.
16. Head of *Acrometopia punctata*.
17. Head of *Phyllomyza securicornis* (male).
18. Head of *Phyllomyza hirtipalpis* (male).
19. Head of *Phyllomyza approximata* (female).
20. Head of *Eusiphona mira*.

PLATE 6.

- Fig. 21. Head of *Hemeromyia nitida*.
22. Head of *Rhincæssa albula*.
23. Head of *Pseudodinia varipes*.
24. Head of *Euchlorops vittata* (dorsal view).
25. Head of ¹*Aldrichiella agromyzina*.
26. Fore femur of *Meoneura lacteipennis*.
27. Fore femur of *Meoneura vagans*.
28. Head of ¹*Tethina rostrata*.
29. Head of *Cryptochætum iceryæ*.
30. Wing of ¹*Aldrichiella agromyzina*.
31. Head of *Pholeomyia leucozona*.
32. Head of *Euchlorops vittata* (side view).

¹ These figures are after Becker.

INDEX TO SUBFAMILIES, GENERA, AND SPECIES.

	Page.		Page.
<i>Acrometopa</i>	150	<i>morosa</i> (<i>Phyllomyza</i>).....	136
<i>Acrometopia</i>	150	<i>Napomyza</i>	129
<i>æneiventris</i> (<i>Agromyza</i>).....	134	<i>nigra</i> (<i>Paramyia</i>).....	141
<i>æthiops</i> (<i>Milichia</i>).....	133	<i>nitens</i> (<i>Paramyia</i>).....	141
<i>Agromyza</i>	129	<i>nitida</i> (<i>Hemeromyia</i>).....	146
<i>agromyzina</i> (<i>Aldrichiella</i>).....	136	<i>nitidula</i> (<i>Phytomyza</i>).....	151
<i>albula</i> (<i>Rhincæssa</i>).....	147	<i>obscura</i> (<i>Hemeromyia</i>).....	145
<i>Aldrichiella</i>	136	<i>obscurella</i> (<i>Meoneura</i>).....	143
<i>Agromyzinæ</i>	129	<i>Oethiphila</i>	130
<i>Anisoneura</i>	144	<i>Oethiphilinæ</i>	129
<i>Anthomyza</i>	147	<i>Odinia</i>	129
<i>approximata</i> (<i>Phyllomyza</i>).....	138	<i>Ophthalmomyia</i>	132
<i>Arctobiella</i>	130	<i>Oxyrhina</i>	150
<i>arcuata</i> (<i>Milichiella</i>).....	132	<i>Paraleucopis</i>	148
<i>Caoxenus</i>	130	<i>Paramadiza</i>	136
<i>Cerodontha</i>	129	<i>Paramilichia</i>	135
<i>cinerea</i> (<i>Milichiella</i>).....	132	<i>Paramyia</i>	141
<i>cinerea</i> (<i>Rhincæssa</i>).....	148	<i>Parodinia</i>	130
<i>cinerella</i> (<i>Tethina</i>).....	147	<i>parva</i> (<i>Milichiella</i>).....	132
<i>coronata</i> (<i>Tethina</i>).....	147	<i>parvula</i> (<i>Tethina</i>).....	147
<i>corvina</i> (<i>Paraleucopis</i>).....	149	<i>pectinata</i> (<i>Meoneura</i>).....	143
<i>Cryptochætum</i>	129	<i>Pholeomyia</i>	134
<i>Euchlorops</i>	139	<i>Phyllomyza</i>	136
<i>Eusiphona</i>	130	<i>Phytomyza</i>	150
<i>halteralis</i> (<i>Paramdiza</i>).....	136	<i>Phytomyzinæ</i>	129
<i>Hemeromyia</i>	144	<i>præsecta</i> (<i>Pholeomyia</i>).....	135
<i>hirtipalpis</i> (<i>Phyllomyza</i>).....	137	<i>primus</i> (<i>Meoneura</i>).....	142
<i>indecora</i> (<i>Pholeomyia</i>).....	134	<i>Psalidotus</i>	142
<i>infuscata</i> (<i>Meoneura</i>).....	143	<i>pseudodecora</i> (<i>Pholeomyia</i>).....	135
<i>lacteipennis</i> (<i>Meoneura</i>).....	144	<i>Pseudodinia</i>	130
<i>lacteipennis</i> (<i>Milichiella</i>).....	133	<i>punctata</i> (<i>Acrometopia</i>).....	150
<i>lacteipennis</i> (<i>Phytomyza</i>).....	152	<i>Rhincæssa</i>	147
<i>leucogastra</i> (<i>Pholeomyia</i>).....	135	<i>Rhynchomilichia</i>	135
<i>Leucopis</i>	130	<i>robertsoni</i> (<i>Pholeomyia</i>).....	135
<i>leucozona</i> (<i>Pholeomyia</i>).....	135	<i>rostrata</i> (<i>Tethina</i>).....	147
<i>Lobioptera</i>	135	<i>scutellata</i> (<i>Agromyza</i>).....	136
<i>longiseta</i> (<i>Paramilichia</i>).....	134	<i>securicornis</i> (<i>Phyllomyza</i>).....	136
<i>lucidula</i> (<i>Milichiella</i>).....	132	<i>similis</i> (<i>Euchlorops</i>).....	140
<i>maculata</i> (<i>Acrometopia</i>).....	150	<i>Stenoporomyia</i>	131
<i>Madiza</i>	136	<i>Tethina</i>	146
<i>magnipalpis</i> (<i>Phyllomyza</i>).....	138	<i>texana</i> (<i>Rhincæssa</i>).....	148
<i>major</i> (<i>Phytomyza</i>).....	150	<i>Traginops</i>	129
<i>Meoneura</i>	142	<i>triticii</i> (<i>Meoneura</i>).....	143
<i>Milichia</i>	133	<i>vagans</i> (<i>Meoneura</i>).....	143
<i>Milichiella</i>	131	<i>vittata</i> (<i>Euchlorops</i>).....	139
<i>Milichinæ</i>	129	<i>xanthopoda</i> (<i>Tethina</i> ?).....	147